

Note: Please be aware that the names of the final procedures submitted as part of Bristol Airport's Stage 2 work have been updated and simplified.

Bristol Airport ACP Stage 2 Design Workshop 2

13/02/20

Attendees

[REDACTED] - NATS Bristol ACP Airspace Design Lead
[REDACTED] - ACOG
[REDACTED] - Cardiff Watch Manager
[REDACTED] - Bristol Watch Manager
[REDACTED] - NATS Procedure Design Group
[REDACTED] - NATS Engineering requirements manager
[REDACTED] - NATS Project Manager
[REDACTED] - NATS Airspace Change Specialist
[REDACTED] - NATS LAMP Development
[REDACTED] - ATM Development Lead
[REDACTED] - LAMP Design Team
[REDACTED] - NATS Bristol GM
[REDACTED] - Bristol Head of Airside Operations

James Shearman (via telecon) – Head of Sustainability

Welcome and introductions

Traffic distribution

Bristol traffic figures shown for June-August 2019 in 45deg splits (assuming direct to/from destination); showing a predominant axis between East and South.

Bristol Head of Sustainability provided a presentation via telecon - BAL and Noise and Complaints

Future demand summary shown – the 2018 consultation for the masterplan aspiration was based on the known forecast demand. By 2045 Bristol Airport is expected to grow to around 19 million passengers.

There were circa 9 million passengers in 2019 and currently there is a 10 million cap (future caps subject to planning application).

Bristol Airport recently introduced new ground infrastructure in 2019 such as increased parking. Other associated improvements in the future include a dedicated bus service, community projects etc.

In 2018 Bristol submitted an application for an increase in passenger numbers to 12 million per year. The application included proposals on airfield works, new junctions, improved car parks etc.

The application was submitted at the end of 2018 (aspiration of 12 million passengers by 2026). Following a committee meeting (Feb 20), councillors refused the application. Wider issues such as climate change, transport, traffic and noise all played a part.

Bristol Airport is considering options and the next steps.

Noise and political climate

There is currently a restriction on the number of night movements at Bristol Airport (between 23:30 – 06:00).

There is currently a Quota Count (QC) budget in place which places a value on different aircraft types, based on the level of noise they generate. There is a higher QC for the summer months.

Bristol also has maximum departure noise limits (Lmax) i.e. daytime limit – 90dB Lmax; night-time limit – 85dB Lmax.

Noise contours are modelled annually based on runway/ direction/ percentage of aircraft departures.

Departure routes which are noise modelled were shown – nominal routes.

■ – why do the 09 SIDs turn in different places? Whereas the 27 departures all appear to turn at the same point?

■ – it is based on actual radar data, so differences will be when a/c reach a height that they can be turned off the SID.

■ – is Bristol noise data available for use in consultation? The CAA's new minimum requirement for noise modelling requires specific airports to provide current noise metrics rather than generic ANCON data.

■ confirmed that local Leq data will be available for consultation purposes i.e. current SID noise data used as a baseline.

Noise contour dwelling counts for Summer 2020 forecast were shown. 866 properties were within the contour level of 54Db and below. Only 13 were in the 63Db and below (number splits are cumulative).

■ – is a noise compensation scheme applied?

■ – confirmed that it is; including double glazing amongst other mitigation techniques. The scheme opens end of March for local residents to apply for – first opened in 2011.

Westerly departure Noise Preferential Routes (NPR) shown – swathes clearly showed the NPR routes which are flown unless directed for reasons of safety, which must be adhered to.

Complaint Data

Total complaints have increased over the previous 3 years (2016 – 167, 2017 – 172, 2019 – 379). This increase correlates with the introduction of the planning application. There has also been a growing number of night-time movements.

However, for around 70K movements a year, this is still not a huge proportion.

The top 3 reasons for complaints are 'general', 'night noise' and 'low flying'.

A breakdown of the complaint locations provided – showed a wide spread of different areas across the region. A lot of the locations are in rural settings with low ambient noise which could further amplify the noise impact.

Winford and Wrington are local councils who are very local and are a key focus for the airport.

Political Climate (North Somerset Council) - predominantly a Conservative led council since 2007 but a noticeable shift in 2019 with more independent councillors e.g. 4 "Portishead Independents" councillors. Bristol remained a Labour base.

■ – the region is largely a lightly populated area with very small villages. Bristol city is densely populated but generates very few complaints. Contributors are likely higher ambient noise and aircraft are usually high when/if crossing the city.

Some Controlled Airspace (CAS) to the North/North east of Bristol Airport has base levels which do not support Continuous Descent Approaches (CDA) . .

In addition, some track data illustrates the effect of the CAS not being large enough to contain flights e.g. aircraft being vectored downwind left for Rwy27.

Noise is likely to be concentrated in the future a lot more due to the precise nature of RNAV procedures. However, this also allows us to position routes more consistently.

Initial PDG assessment – NATS Design Lead

Summary of initial procedure assessments completed by NATS PDG. The assessment was based on indicative routes developed in Bristol's first design workshop (January 2020).

- 09 Left Turn Out (LTO) Route 1 – climb gradients of 3.3% & 8% were looked at. There was a difference in turn radii and distance taken to fully turn. Turns started at 500ft and an assumed 250KTS speed limit was used; a lower speed limit may help flights avoid overflying Bristol centre by tightening the turn radius and turning inside of the city. *(Note: this assumption was confirmed subsequently by airline reps at engagement session later in February).*
The assessment looked at where routes reach 7,000ft – this was just before the estuary for the 8% climb and beyond the estuary for the 3.3% climb.
- 09 LTO Route 2 towards Brecon (BCN) – climb gradients of 3.3% and 8% used again. PDG suggested that something a bit tighter could potentially be achieved, as above. The assessment showed a similar location of reaching 7,000ft for the different gradient options (before/ after the river) as for the 09 LTO Route 1 (above).
- 09 RTO Route 8, and 27 LTO Route 5A – same criteria looking at the initial ground track and climb gradient. Mendips would most definitely be overflowed, although different criteria for turn design could give flexibility on track. The Pen Hill mast did not feature re obstacle clearance even at minimum climb gradient.
- 09 departures to abeam KENET – a minimum climb gradient (~8%) would be required to achieve draft LAMP requirement of FL230, although a speed restriction of 250kts or less may also be needed.

Design Options Development

Update provided following on from the Bristol/ LAMP workshops.

Bristol current tracks shown (arrivals & departures, 0 – FL180) taken from radar data. Departures to the South were discussed; The improved tracks at weekends were illustrated. This is currently not a permanently available route but a lower CAS base south of LAMAT would benefit track and climb profiles.

A lot of BCN departures were shown to fly direct towards AMMAN.

Same radar tracks image shown for Cardiff arrivals and departures.

Majority of southerly Cardiff departures route down the West side of N864.

Traffic can be seen to avoid Bristol flights.

Further image shown with Bristol and Cardiff radar track data together. The most significant factor of all this is the wide spread of tracks, evidence of tactical intervention being the norm with hardly any a/c following the SID/STAR as published.

LAMP Design/ Upcoming Sims Update – LAMP Design Lead

DesignAir high-level prototype model presented – included Bristol, Cardiff, other adjacent airfields, danger areas.

The high-level network routes were overlaid (5 east/west and 4 north/south) – currently the prototype's indicative routes are positioned purely for simulation purposes. The prototype also includes current ATS routes which may still be used/ useful in the future. The Holds are also included but without levels at this point (just an option of where the Holds could geographically be placed – uses rough Lat/ Longs provided after a previous Surge workshop).

The Cardiff delegated ATS area was shown, which will likely have to increase in size in order to contain new ATS routes in the future.

The prototype doesn't currently include routes below 7,000/ 8,000ft; such as the transitions from the Holds.

The Hold shown to the South has challenges – it is currently positioned in the EGFF delegated ATS area but will need further exploration.

The proposed first-rotation offload route to the South-east was currently shown as flying directly through Salisbury Plain, which is not currently a managed danger area. The alignment of this will need further examination by LAMP as the area where it would re-join the network (broadly around the SAM area) will not be altered by LAMP until ACP 2.

Action: [REDACTED] to send [REDACTED] snapshot of Design Air

Action: [REDACTED] to have input and involvement in RTS e.g. with draft SIDs/ STARs/ Holds to simulate. [REDACTED] - suggestion to also attend as observers.

Although this initial development RTS is a first look at the viability of the proposed network, there will probably need to be several different focussed sims e.g. examination of Cardiff/ Bristol operations.

There is no Bristol resource currently allocated to the sim activities. Any appropriate sim outputs would be a useful input to the Bristol ACP Stage 2 work i.e. what works, or definitely does not work, with the current network prototype design.

Sims will be focussed on elements such as traffic flow interactions based on the prototype.

Agreement for Bristol to provide information to feed into the sims e.g. how the Holds are managed, traffic presentation, different Hold locations, different Hold levels.

[REDACTED] – question on level of MoD engagement so far?

[REDACTED] – only through one workshop as of yet.

Point flagged up that there may be various steps/ iterations before all objectives are fully delivered and support low-level aspirations. S25 specifically mentioned as its legacy airspace which will be difficult to change. LAMP is spread over several deployments – some of the changes in later deployments may be needed by airports who are involved in earlier

deployments. Optimal low-level designs might not be feasible for several years.

Summary of output from the LAMP surge workshop

Runway 27 departures – following the workshop discussion, routes 4, 6A and 8 were removed and route 6 was re-aligned.

All routes shown as dashed are to be queried and explored further.

Route 6 may require an FUA agreement with the MoD which would have to acknowledge the known ~45 mins off-block time requirement.

The end-point of route 5 may change as it is very dependent on LAMP and other traffic flows in this region.

Runway 09 departures – routes 4, 4A and 8 have been removed route 6 re-aligned.

All routes shown as dashed are to be queried and explored further.

Routes 7 & 7A are dependent on the position of the Hold (7A would provide additional respite).

RADSIM work may allow 1 min splits without the need for 45deg splits.

Discussion on tactically changing departure routes (e.g. for respite purposes) - on start-up, is the very latest time a pilot could be told about a change in departure route. This point was discussed at a recent workshop with ACOG. There are also safety benefits for the flight-crew knowing what they are going to fly in advance e.g. potential HF issues.

LAMP request will be for Bristol to provide indicative designs to be input into the whole en-route prototype model.

Bristol Designs

Holds

Hold location names have been changed to:

- Hold A – to the North
- Hold B – to the South-West
- Hold 5 – to the West, just South-West of Cardiff
- Hold C – to the West of Hold B
- Hold D – to the East of Hold B

Interactions with Runway 27 operations

Runway 27 inbound routes from the South were overlaid with departure routes.

Hold A – there could be a lateral interaction with departures on Route 5; however, there was a suggestion that departures are likely to be much higher. To overcome this, SIDs could include

a coded level restriction in order to separate i.e. at or above FL90 by a certain route.
Alternative suggestion to use a minimum gradient requirement.

Hold B - could create difficult interactions between arrivals and departures.

Hold B – airlines on departures to the South unlikely to dislike this location if they are kept low on departure in order to stay below the Hold.

Hold C – possible interactions with over-flights (Manchester/ Exeter)

It is best to systemise the split as much as possible because some controllers may not be as comfortable/ confident as others to keep climbing an aircraft due to a level off at 6,000ft.

A big constraint at Bristol is that the Radar Manoeuvring Area (RMA) is nowhere near as large as it needs to be.

Point raised on the Brize Norton ACP, which is proposing to impact airspace North-East of where Hold A is positioned.

Hold D would completely avoid departures to the South however arrivals from Hold C may be around the same levels as these departures.

Discussion on the need for a Hold – currently the overhead Hold is primarily used for bad weather but in the future, a Hold would be used to change the way traffic managed. Currently traffic is managed on a tactical, workload-heavy basis – aspiration for Bristol to introduce a more systemised design, requiring less intervention.

The further out a Hold is it makes the Approach Controllers job more difficult in judging when to take aircraft off and manage the sequence/ separations.

An offload Hold would also likely be positioned entirely within Swanwick airspace.

As a Hold requires a large amount of CAS, it would be useful to understand exactly what military requirements are – radar data not necessarily the best source of information – through continued engagement.

Summary of Holds on 27 deps

Hold A

Pros – connects with the network well; works with LAMP prototype particularly with traffic from east/ north; fully under Bristol's control; mostly contained within existing CAS; appropriate distance from touchdown; not in the overhead as per the current Hold; appears to give sufficient Holding Levels (approx. 7); small population impacted underneath

Cons – possible requirement for new CAS (overlaps with one of the benefits); possible interaction with Brize Norton ACP; probable interaction with Gloucester joining traffic

(primarily bizjets); possible interaction with Birmingham departures (MOSUN SID specifically mentioned); possible interaction with Q63 overflights (east-west airway); would require lowering the CAS base; would introduce an increase in Bristol delegated function required; potential visual intrusion for new communities

It could probably be separated from proposed departure route – appears possible but would need to be ensured

Hold B

Pros – appropriate distance from both runways (albeit a bit closer to 09); not in the way of some Cardiff departures

Cons – conflict with Bristol southerly departures; potentially complex to manage from an ATC perspective; straddles the airspace between Bristol/ Cardiff (tactical management)

It could require some new CAS (dependent on N90) but not as much as other Hold options

Hold C

Pros – less interaction with GP departures than other Hold options, minimal requirement for new CAS

Cons – cross-over with departing traffic would have to be managed, same management issues as Hold B, direct conflict with FF departures (similar levels), conflict with Exeter traffic

Hold D

Pros – no conflict with Bristol departures; ideally suited for track mile distance to both runway ends; tactically easy to manage; simple interaction with the network; could potentially be transferred directly to Bristol (assume it's through Cardiff though)

Cons – requirement for new CAS; holding over newly impacted population (visual intrusion); directly over Glastonbury

Better Hold location suggestions:

Hold D further North (orientation East-West) would lessen the landgrab – still achieves the above benefits. Moving it further East would take it further from the 27 departures.

A Hold between B and D would also work better than the above; require less airspace.

Summary of Holds on 09 deps

Hold A

Pros – same as above for 27, Hold itself is separated well from departures (just not arrivals after leaving the Hold)

Cons – cross-over between inbounds and outbounds, conflicts would likely occur at similar levels to the Hold, difficult separation design with aircraft climbing towards a climb (routes 1B, 2B), CDAs could be impacted, new CAS and lowered base required

There are enough regular departures off Runway 09 in this direction for this to be a problem. A RH turn on departure could avoid this issue.

This Hold could be made easier to manage if the left-hand SIDs are moved further South (towards Bristol). You could also potentially leave the Hold on a more Westerly path.

Hold B

Pros – same as above for 27 (not too much airspace grab, good connectivity and location, clear of desired outbounds to the south)

Cons – as above

Route 7 could turn West to begin with in order to remove the location of this Hold

Hold C

Pros – good position for EGGP, not conflict with EGGP arrivals/ departures, better fit with network

Cons – interaction with EGFF departures (particularly off Runway 12); air traffic management when the Hold is active unknown

Hold D

Pros – same as above; potential to deconflict from Route 7 departures (easier to do than Hold B); clear of all Cardiff traffic

Hold B could be moved further East to resolve the amount of CAS required. It would still be possible to deconflict departures. This would also take the Hold location further from Cardiff Runway 12 departures.

Hold D could be moved further North which would create conflict with Route 7. Route 7A may resolve this (09 left-turn out) or introduce a level-cap; albeit not ideal. Likely holding over the AoNB.

Option E - suggestion for a Hold to be positioned over the Estuary between Bristol and Cardiff. Although Cardiff departures off Runway 12 would need to be worked with – the proportion of traffic should also be taken into consideration: ~80% Bristol/ ~20% Cardiff.

There are obvious issues to overcome such as ATM issue and Bristol arrivals onto 09 having to make up miles but there are also several benefits, other Hold options do not offer e.g. not over land, less CAS required.

It might need to be at a reasonably high level (FL90/100) in order to allow continuous descents and interaction with EGFF traffic.

Alignment should be positioned against the known traffic flows.

Another issue might be not being procedurally separated from where Hold option 5 is positioned.

Note to be cognisant that Cardiff have put a Design Principle forward for a shared Hold with Bristol.